

REMARKS

Claims in the case are 1, 2, 4, 7, 10 and 11. Claim 2 has been amended herein. No claims have been added and no claims have been cancelled in the present amendment.

Applicants note with appreciation the reopening of prosecution pursuant to 37 C.F.R. §1.114 in the present case, and the entry of their amendment dated 3 November 2003.

Claim 2 stands rejected under 35 U.S.C. §112, second paragraph with regard to lacking basis for the term "the reactor." Claim 2 has been amended to replace the term "the reactor" with --the static mixer--. Basis for "the static mixer" is found in Claim 1, from which Claim 2 depends. In light of the amendments herein and the preceding remarks, Applicants' claims are deemed to particularly point out and distinctly claim the subject matter which they regard as their invention.

Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1, 2, 4, 7, 10 and 11 stand rejected under 35 U.S.C. §112, first paragraph. This rejection is respectfully traversed with regard to the following remarks.

In the present rejection, it is argued that the specification does not provide basis for exclusion of the pre-mixing step. Applicants respectfully disagree. The specification is deemed to disclose performing the mixing of reactants and formation of the thermoplastic polyurethane contemporaneously in a reactor without a separate pre-mixing step. See page 3, lines 4-6 of the specification in which the reactants are disclosed as being homogeneously premixed in a reactor (i.e., the same reactor in which the reactants are reacted). Attention is further directed to page 9, lines 4-5 of the specification, where it is disclosed that any type of reactor may be used.

In light of the preceding remarks, Applicants' specification is deemed to provide a written description of their invention that is presented in such full, clear, concise, and exact terms so as to enable a skilled artisan to which it pertains to practice same. Reconsideration and withdrawal of the present rejection is respectfully requested.

Claims 1, 2, 4, 7, 10 and 11 stand rejected under 35 U.S.C. §112, first paragraph. This rejection is respectfully traversed with regard to the following remarks.

In the present rejection, it is argued that the term "polyaddition" does not entail formation of a thermoplastic polyurethane, but merely denotes that a reaction has begun, and as such, Applicants' specification does not provide support for forming a polymer within the static mixer. Applicants respectfully disagree.

As is known to the skilled artisan, the process of polymerization is generally described as being performed in two ways: by either polycondensation reactions or polyaddition reactions. Polycondensation reactions are characterized as resulting in the formation of a polymer that has a molecular weight that is less than that of the monomers from which it was synthesized, due to the concurrent formation of so-called split-out molecules (e.g., water in the case of polyester synthesis). While the term polyaddition (or polyaddition reaction) is generally used to describe the polymerization of monomers containing double bonds (e.g., free radical polymerization), it is more generally understood to describe those polymerizations in which no split-out molecules are formed, and in which the molecular weight of the polymer is theoretically equivalent to that of the monomers from which it is formed (e.g., as is the case with the formation of thermoplastic polyurethanes). See the *Encyclopedia of Chemical Technology*, Fourth Edition, Volume 19, Kirk-Othmer, John Wiley & Sons, 1996, pp. 881-883 (included herewith in the appendix).

It is respectfully submitted that, regarding polymer synthesis, a skilled artisan would recognize and understand the term "polyaddition" as being synonymous with the term "polymerization," in particular with regard to the outcome of such synthesis (i.e., the formation of a polymer - and not merely the start or beginning of a reaction). The term "polyaddition" is a species of the generic term "polymerization," and in the absence of any qualifying language to the contrary, is understood to denote the formation / synthesis of a polymer, rather than merely the beginning of a reaction. As such, Applicants' specification does provide disclosure with regard to forming the thermoplastic polyurethane in a static mixer.

In light of the preceding remarks, Applicants' specification is deemed to provide a written description of their invention that is presented in such full, clear, concise, and exact terms so as to enable a skilled artisan to which it pertains to practice same. Reconsideration and withdrawal of the present rejection is respectfully requested.

Claims 1, 2, 4, 7, 10 and 11 stand rejected under 35 U.S.C. §112, first paragraph. This rejection is respectfully traversed with regard to the following remarks.

On pages 3 and 4 of the Office Action of 16 December 2003, it is argued that Applicants' specification does not disclose how the product thermoplastic polyurethane is removed from the static mixer, and how to prevent the static mixer from becoming plugged. Applicants respectfully contend that the specification is sufficiently enabling in this regard. Applicants' claimed invention is a process for the continuous preparation of thermoplastic polyurethane elastomers (see page 2, lines 15-16 of the specification, and the preamble of Claim 1). Monomers are continuously introduced into the static mixer, which has a tube-like configuration (e.g., having a length to diameter ratio of 8:1 to 16:1 - Claim 4). As such, one of ordinary skill in the art would recognize that as thermoplastic polyurethane elastomer is continually formed within the static mixer, it is also continually pushed out of the static mixer by means of the continuous introduction of monomers therein.

In light of the preceding remarks, Applicants' specification is deemed to provide a written description of their invention that is presented in such full, clear, concise, and exact terms so as to enable a skilled artisan to which it pertains to practice same. Reconsideration and withdrawal of the present rejection is respectfully requested.

Claims 1, 2, 4, 7, 10 and 11 stand rejected under 35 U.S.C. §103(a) as being unpatentable over United States Patent No. 5,739,252 (**Kirchmeyer et al**) in view of United States Patent No. 3,642,964 (**Rausch et al**). This rejection is respectfully traversed in light of the following remarks.

Kirchmeyer et al disclose the preparation of thermoplastic polyurethaneurea elastomers by first mixing the isocyanate and active hydrogen reactants in a separate first static mixer (under conditions such that no reaction occurs between these reactants), and then reacting the mixed reactants in a second and separate static mixer (abstract). The residence time in the first static mixer is disclosed by Kirchmeyer et al as being 0.01 to 5 seconds (column 6, lines 28-35). The residence time in the second static mixer is disclosed by Kirchmeyer et al as being 0.1 to 10 minutes (i.e., a minimum residence time of 6 seconds) (column 6, lines 61-62). As such Kirchmeyer et al disclose a total residence time of at least 6.01 seconds.

It is argued on page 5 of the Office Action of 16 December 2003 that Kirchmeyer et al's disclosure of various residence and reaction times are only preferred, and that the residence times are close enough to those of Applicants' present claims that one would have expected the processes to yield equivalent products. Applicants respectfully disagree. Kirchmeyer et al disclose their process as necessarily including separate pre-mixing and reaction steps, each being conducted in a separate static-mixer. The process of Applicants' present claims is performed in a single static mixer. As such, Kirchmeyer et al's disclosure as to residence times does not reasonably extend to or touch upon the process of Applicants' present claims.

For purposes of argument, Applicants wish to point out that Kirchmeyer et al's disclosed minimum total residence time of 6.01 seconds represents a 20% increase in residence time relative to Applicants' present Claim 1 (residence time in the static mixer of less than 5 seconds, e.g., 4.99 seconds), and as such is not so close as to be reasonably equivalent. In addition, Kirchmeyer et al's disclosed minimum total residence time of 6.01 seconds represents a 141% increase in residence time relative to Applicants' present Claim 10 (residence time in the static mixer of less than 2.5 seconds, e.g., 2.49 seconds), and as such is not so close as to be even remotely equivalent.

Rausch et al disclose a process for preparing thermoplastic polyurethanes in an extruder (abstract). Rausch et al disclose a residence time in the feed zone of the extruder of 1 to 6 seconds (column 6, lines 40-46); and a residence time in the mix zone of the extruder of 6 to 50 seconds (column 7, lines 35-39). The residence time in the extrusion zone of the extruder is disclosed by Rausch et al as not being crucial (column 8, lines 36-39). In the examples, Rausch et al disclose an extrusion zone residence time of 50 seconds (column 11, lines 36, and column 12, line 69). As such, Rausch et al disclose an extruder residence time that is greater than 7 seconds. In the examples, Rausch et al disclose extruder residence times of: 150 seconds (examples 1-3, column 11, lines 29-36, column 12, lines 1-2, and column 12, lines 65-69); and 40 seconds (example 4, column 13, lines 47-49).

Kirchmeyer et al discloses the preparation of thermoplastic polyurethaneurea elastomers by means of two static mixers that are arranged in series. Rausch et al disclose a process for preparing thermoplastic polyurethanes in an extruder. As such, neither Kirchmeyer et al nor Rausch et al provide the requisite disclosure that would motivate a skilled artisan to combine or otherwise modify their respective disclosures to arrive at Applicants' presently claimed method. As the Court of Appeals for the Federal Circuit has stated, there are three possible sources for motivation to combine references in a manner that would render claims obvious. These are: (1) the nature of the problem to be solved; (2) the teaching of the prior art; and (3) the knowledge of persons of ordinary skill in the art, *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1458 (Fed. Cir. 1998). The nature of the problem to be solved and the knowledge of persons of ordinary skill in the art are not present here and have not been relied upon in the rejection. As for the teaching of the prior art, the above discussion has established that neither of the patents relied upon in the rejection provide the requisite teaching, and certainly do not provide the motivation or suggestion to combine that is required by Court decisions.

It is respectfully submitted that the rejection appears to impermissibly use Applicants' application as a blueprint for selecting and combining or modifying the cited references to arrive at Applicants' claimed invention, thereby making use of prohibited hindsight in the selection and application of those cited references. The


use of hindsight reconstruction of an invention is an inappropriate process by which to determine patentability, *In re Rouffet*, 47 U.S.P.Q.2d at 1457 (Fed. Cir. 1998). "To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." *W.L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983). It is essential that "the decisionmaker forget what he or she has been taught at trial about the claimed invention and cast the mind back to the time the invention was made ... to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art." *Id.* One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 837 F.2d 1071, 1075 (Fed. Cir. 1988).

In addition, even if Kirchmeyer et al and Rausch et al were combined, Applicants' claimed invention would not result there-from. Kirchmeyer et al and Rausch et al, either alone or in combination do not disclose, teach or suggest forming a thermoplastic polyurethane elastomer in a reactor (e.g., a static mixer) under conditions such that the residence time within the reactor is less than 5 seconds.

In light of the preceding remarks, Applicants' claims are deemed to be unobvious and patentable over Kirchmeyer et al in view of Rausch et al. Reconsideration and withdrawal of this rejection is respectfully requested.

In light of the amendments herein and the preceding remarks, Applicants' presently pending claims are deemed to meet all the requirements of 35 U.S.C. §112, and to define an invention that is unanticipated, unobvious and hence, patentable. Reconsideration of the rejections and allowance of all of the presently pending claims is respectfully requested.

Respectfully submitted,

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